DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/29/2009 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 1-9** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Based on the disclosure and the drawings, it is unclear to a person of ordinary skill in the art at the time of invention as to how the thermal exchange device, specifically walls 500, will be arranged with respect to the component intended to be cooled. In other words, it is unclear how the thermal heat exchange device is going to provide cooling to the components given the vague description and illustration of the wall configuration. For example, is the thermoelectric component (100) exposed to both the "internal" and "external" airflows? Or does the wall assembly form a seal between the thermoelectric component (100) and only the heat pipe (210) and fins (350) are exposed to the

"external" air flow? Specifically, claim 1 starting at line 7 recites "...a housing comprising a first housing wall and a second housing wall, wherein the first housing wall is positioned on the upper side of the thermal electric cooling unit and the second housing wall is positioned on the lower side of the thermal electric cooling unit.." This recitation does not clarify the relationship between the housing walls and the thermoelectric cooling unit, or how the system will work in relation to the component to be cooled. Thus in light of the specification and the claim language the disclosure provided as a whole, implicitly or otherwise, is unclear as to how the thermal heat exchange device is going to provide cooling to the components to be conditioned.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Neil (US 5621614) in view of Hood, III et al. (US 6038128).

Regarding claim 1, O'Neill teaches a thermal exchanger device comprising: a planar thermal electric cooling unit (80) having a upper planar side and a lower planar side, comprising a first planar plate (plate of unit 80 closest to element 82 shown in Fig. 3) positioned on the upper side and a second planar plate (plate of unit 80 closest to element 102 shown in Fig. 3) positioned on the lower planar side of the unit (looking from the exterior side as defined by the O'Neill spec); a housing (formed by plates 34 and 100 when assembled; see Fig. 4) comprising a first housing wall (34) and a second housing wall (100), wherein the first housing wall is

positioned on the upper side of the thermal electric cooling unit and the second housing wall is positioned on a lower side of the thermal electric cooling unit and external and internal fans (86 and 96) provided over fins (82 and 92).

O'Neil fails to explicitly teach a first heat pipe positioned within the first planar plate wherein a predetermined portion of the first heat pipe extends laterally beyond the first planar plate to an exterior of the housing; a second heat pipe positioned within the second planar plate wherein a predetermined portion of the second heat pipe extends laterally beyond the second planar plate to an interior of the housing, and a plurality of fins formed on the predetermined portion of each of the heat pipes.

However, Hood teaches an electronic cooling system having a heat generator (16) enclosed in a housing (30) provided with a heat pipe (32) extending into and projecting from a side wall of the processor housing. The heat pipe (32) has a plurality of fins (34) formed on the heat pipe (see Figs. 1 and 3; Col. 2, lines 30-35 and 53-57). Hood implicitly teaches that this configuration provides improved cooling without the need for increasing the size of the fan and/or the heat exchangers (Col. 2, 39-43).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to modify the heat sink configuration in the system of O'Neil to include a first heat pipe extending laterally beyond the first planar plate to an exterior of the housing and a second heat pipe positioned within the second planar plate wherein a predetermined portion of the second heat pipe extends laterally beyond the second planar plate to an interior of the housing and a plurality of fins formed on the predetermined portion of each of the heat pipes replacing

elements (82, 102, and 92) in order to provide improved cooling without the need for increasing the size of the fan and/or the heat exchangers in view of the teaching by Hood.

Although Hood only shows one heat pipe and fin assembly, a person of ordinary skill in the art at the time of invention would recognize that since unit (80) taught by O'Neil operates as a heat pump the heat pipe assembly would be added to both sides of the unit in order to provide to provide improved heat exchange transmission for both modes of operation.

Regarding claim 2, O'Neil as modified above teaches the invention as recited above but fails to explicitly teach that the first heat pipe is positioned in a center of the first planar plate and the second heat pipe is positioned in a center of the second planar plate.

However, it would have been obvious to a person of ordinary skill in the art at the time of invention to position the heat pipes in the center of each of the planar plates since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Regarding claim 3, O'Neil teaches a thermal exchange device comprising: a thermal electric cooling unit (80) comprising a first planar plate (plate closest to element 82; see Fig. 3) and a second planar plate (plate closest to element 92; see Fig. 3), wherein the first planar plate is in a first plane and the second planar plate is in a second plate which is below the first plane (looking from the exterior side as defined by spec); a first housing wall (34) positioned above the first plane; a second housing wall (100) positioned below the second plane.

O'Neil fails to explicitly teach a first heat pipe positioned within the first planar plate and extending laterally to an exterior of the housing; a first plurality of fins formed on the first heat pipe, the first plurality of fins extending radially from the second heat pipe; and a second

plurality of fins formed on the second heat pipe, the second plurality of fins extending radially from the second heat pipe.

However, Hood teaches an electronic cooling system having a heat generator (16) enclosed in a housing (30) provided with a heat pipe (32) extending into and projecting from a side wall of the processor housing. The heat pipe (32) has a plurality of fins (34) formed on the heat pipe (see Figs. 1 and 3; Col. 2, lines 30-35 and 53-57). Hood implicitly teaches that this configuration provides improved cooling without the need for increasing the size of the fan and/or the heat exchangers (Col. 2, 39-43).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to modify the heat sink configuration in the system of O'Neil to include a first heat pipe positioned within the first planar plate and extending laterally to an exterior of the housing; a first plurality of fins formed on the first heat pipe, the first plurality of fins extending radially from the second heat pipe; and a second plurality of fins formed on the second heat pipe, the second plurality of fins extending radially from the second heat pipe replacing elements (82, 102, and 92) in order to provide improved air conditioning without the need for increasing the size of the fan and/or the heat exchangers in view of the teaching by Hood.

Although Hood only shows one heat pipe and fin assembly, a person of ordinary skill in the art at the time of invention would recognize that since unit (80) taught by O'Neil operates as a heat pump the heat pipe assembly would be added to both sides of the unit in order to provide improved heat exchange transmission for both modes of operation.

Regarding claim 4, O'Neil as modified above teaches the invention as recited above and O'Neil further teaches the system comprising an external fan (86) formed on an upper side of the first plurality of fins (see Fig. 3).

Regarding claim 5, O'Neil as modified above teaches the invention as recited above and O'Neil further teaches that the external fan processes an outside air (Col. 3, line 64 – Col. 4, line 2; see Fig. 1).

Regarding claim 6, O'Neil as modified above teaches the invention as recited above and O'Neil further teaches the system comprising an internal fan (96) formed on a lower side of the second plurality of fins (see Fig. 3).

Regarding claim 7, O'Neil as modified above teaches the invention as recited above and further teaches that the internal fan (96) processes the air within the first housing wall (34) and the second housing wall (100; Col. 4, lines 3-6; see Fig. 1).

6. **Claims 8-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Neil (US 5621614) and Hood, III et al. (US 6038128) further in view of Chang et al. (US 6474407).

Regarding claims 8 and 9, O'Neil as modified teaches the invention as recited above but fails to explicitly teach that the first and second plurality of fins are high density fin stacks.

However, Chang teaches a composite heat sink with high density fins in Fig. 3. Chang further teaches that since the surface area has a major influence on the overall heat transfer, the heat sink is generally constructed to have a flat base with a plurality of flat fins; and in order to dissipate more heat a sink with a greater number of fins, which is referred to a high density fin heat sink, is developed (Col. 1, lines 25-31).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to further modify the system of O'Neil to include high density fins for the first and second plurality of fins in order to dissipate more heat in view of the teaching by Chang.

Response to Arguments

7. Applicant's arguments with respect to amended claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAKIYA ROGERS whose telephone number is (571)270-7145. The examiner can normally be reached on M-F: 8am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, please contact the examiner's supervisor, Cheryl Tyler on (571)272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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